



## MHRD Scheme on Global Initiative on Academic Network (GIAN)



## Sustainable Approaches in Postharvest Handling and Value Addition of Fresh Produce

January 27-31, 2025

### Course Instructor

**Prof. Pankaj B Pathare**

Associate Professor  
Dept. of Soils, Water & Agricultural Engineering  
College of Agricultural & Marine Sciences, Sultan Qaboos University,  
OMAN.

### Course Coordinator(s)

**Dr. Arun Prasanth Venugopal**  
&  
**Dr. Vivek Kambhampati**



**Department of Food Process Engineering**  
**National Institute of Technology, Rourkela**  
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## Course Overview

In today's rapidly evolving agricultural landscape, the efficient handling and enhancement of fresh produce are essential for economic growth and environmental sustainability. Participants will gain valuable insights into innovative practices, cost-effective technologies, and eco-friendly methods that contribute to the preservation of product quality, reduction of postharvest losses, and creation of value-added products, while critically evaluating the sustainability of each approach.

This course is tailored to Masters and PhD scholars and food industries, including farmers, agribusiness entrepreneurs and food processors. It is suitable for anyone eager to enrich their understanding of sustainable practices related to fresh produce. By the end of the course, participants will be equipped with the expertise needed to revolutionize postharvest handling practices, minimize losses, create value-added products, and contribute to a more sustainable and economically prosperous fresh produce industry. Join us in this transformative journey toward a greener, more profitable future in agriculture.

## Objectives

The primary objective of this course is to equip students with the knowledge and skills necessary to apply sustainable postharvest handling and value-addition technologies in the food processing sector. By the end of the course, students should be able to:

1. Understand the importance of sustainable postharvest handling and value addition in the agriculture and food industry, incorporating economic, environmental, and social dimensions.
2. Implement best practices for harvesting, sorting, packaging, and transportation to reduce postharvest losses, with a focus on low-cost, effective solutions for smallholder farmers.
3. Evaluate and select suitable storage solutions that maximize product shelf life while minimizing environmental impact and resource use.
4. Recognize the potential for value addition in fresh produce through processing, packaging, and branding, ensuring that these processes are accessible and economically viable for farmers.
5. Apply quality control measures and food safety standards to ensure the safety and integrity of fresh produce across the supply chain.
6. Identify market opportunities and tailor marketing and branding strategies to meet consumer preferences and industry trends, with an emphasis on sustainability.

7. Integrate sustainability principles into agricultural and agribusiness operations, focusing on waste management, resource optimization, and efficient supply chain management to enhance both profitability and environmental conservation.

## Teaching Faculty



Prof. Pankaj B. Pathare, is an Associate Professor in the Department of Soils, Water, & Agricultural Engineering at the College of Agricultural & Marine Sciences, Sultan Qaboos University, Oman. He earned his PhD from University College Cork, Ireland, specializing in Process & Chemical Engineering. His research focuses on

innovative, sustainable approaches to preserving food quality during storage and enhancing value through postharvest treatments. His work in food processing is highly regarded internationally for addressing food loss reduction and promoting environmentally conscious food handling practices.

As an expert in postharvest engineering, he has made significant contributions to the field through numerous research projects and publications on the impact of storage, processing, and packaging on fresh produce quality. He leads a research team investigating techniques that enhance produce's shelf life and nutritional quality through eco-friendly practices, such as sustainable packaging and minimal processing methods. His work is supported by competitive grants and collaborations with international research institutions, underscoring his role in pioneering sustainable food handling technologies.

He has supervised several graduate students and is a well-published author in high-impact journals, with over 100 peer-reviewed articles, conference papers, and book chapters. His research group frequently collaborates with industry partners, providing actionable insights that bridge academic research with practical applications in food handling. He is the editorial board member of Journal of Food Quality, Discover Food, Measurement: Food and Frontiers in Sustainable Food Systems. He has active professional membership in the Institution of Agricultural Engineers, UK (IAgrE) (Member), Indian Society of Agricultural Engineer ISAE (Life Member), American Society of Agricultural & Biological Engineers, ASABE (Member) and International Society for Horticultural Science, ISHS (Member) as a committed advocate of sustainable agriculture. He is recognized as a World Top 2% Scientist by Elsevier & Stanford University in 2022, 2023, and 2024. He is an invaluable contributor to advancing sustainable postharvest practices, reinforcing Sultan Qaboos University's reputation in the global food science research community.

## Course Content

### Day I

**Lecture 1:** Importance of Postharvest Handling in minimizing food losses.

**Lecture 2:** Socio-cultural factors affecting the adoption of postharvest technologies.

**Lecture 3:** Cold plasma for fresh produce quality and safety.

**Tutorial/practical:** Practical demonstration of cold plasma generation equipment.

### Day II

**Lecture 1:** Non-thermal techniques for fresh produce quality and safety.

**Lecture 2:** Irradiation techniques for fresh produce quality and safety.

**Lecture 3:** Microbial inactivation by non-thermal techniques.

**Tutorial/practical:** Experiment on microbial inactivation in food system using Irradiation techniques / Cold plasma.

### Day III

**Lecture 1:** Ozone for fresh produce quality and safety.

**Lecture 2:** Electrolyte water for fresh produce quality and safety.

**Lecture 3:** Effect of Ozone/ Electrolyte water treatment on organoleptic properties of various food products.

**Tutorial/practical:** Evaluation of textural and nutrient content of Ozone/ Electrolyte water treated foods.

### Day IV

**Lecture 1:** Ethylene management for fresh and vegetables during postharvest handling.

**Lecture 2:** Economic sustainability and Life-cycle analysis of postharvest tools and techniques.

**Lecture 3:** Non-destructive techniques for quality detection.

**Tutorial/practical:** Evaluation of various properties of foods using Non-destructive techniques.

### Day V

**Lecture 1:** Use of IoT and sensors for monitoring and optimizing postharvest storage)

**Lecture 2:** Biosensors in postharvest management

**Lecture 3:** Waste management in postharvest systems.

**Tutorial/practical:** Postharvest losses quantification and composting and recycling of agricultural waste.

## Event Type

This is an international event. Lectures will be offered in the Offline mode only.

## Course Coordinator(s)



Dr. Arun Prasath Venugopal is an Assistant Professor in the Department of Food Process Engineering at NIT Rourkela. He earned his PhD in Agricultural Processing and Food Engineering from Tamil Nadu Agricultural University (TNAU) from 2012 to 2016. With a rich academic background, he has served at Tamil Nadu Agricultural University (2016–2020) and

Kerala Agricultural University (2015–2016) before joining NIT Rourkela in 2020. His research expertise encompasses cutting-edge fields like food packaging and storage, cold plasma technology, and green extraction techniques, focusing on sustainable, innovative approaches to food preservation and quality.



Dr Vivek Kambhampati is an Assistant Professor in the Department of Food Process Engineering of NIT Rourkela since June 2023. He pursued his Ph.D. in Food Process Engineering from National Institute of Technology (NIT) Rourkela. Before joining NIT Rourkela as an Assistant Professor in Indian

Institute of Plantation Management, Bengaluru (2020-2023) and Karunya Institute of Technology and Sciences (2019-2020). His research interest includes process modelling & optimization, functional foods, drying & dehydration, novel non-thermal technology, and postharvest management.

## Who can attend?

- ❖ Executives, Food engineers and Researchers from manufacturing, service and government organizations including R&D laboratories.
- ❖ Faculty from reputed academic institutions and technical institutions.
- ❖ Students at all levels (B.Tech/M.Sc./M.Tech. /Ph.D.)
- ❖ Participation certificate will be given to all the participants

## Registration Fee

Participants from abroad	\$ 200/- (incl. GST)
Academic Institutions (Students)	Rs 1000/- (incl. GST)
Faculty/Scientist	Rs 2000/- (incl. GST)
Industry/ Research Organizations	Rs 3000/- (incl. GST)

The above fee is only for participation in the event in the offline mode. Lecture materials and necessary reading materials will be provided.

\*Foreign teaching faculty will handle the course from NIT Rourkela.

The Participant need to send the willingness to attend the course at <https://forms.gle/LcA9omqFgC3tCvns9> latest by **10 Jan 2025**.

Upon receipt of willingness, course coordinators will send the registration link to the selected students.

## How to Register?

Accepted Candidates are requested to complete payment through NEFT Transfer to the following account details: Name of the Beneficiary: Continuing Education, NIT Rourkela; Name of Bank: State Bank of India; Branch Code: NIT Rourkela; Branch Beneficiary Account No.: **10138951784**; Bank MICR Code: **769002007**; Bank IFS Code: **SBIN0002109**.

## Important dates and venue

Last date for Registration	January 10, 2025
Course Schedule	January 27-31, 2025
Venue	NIT Rourkela

**The course will be conducted in Offline Mode**

**January 27<sup>th</sup> – 31<sup>st</sup>, 2025**

## Contact Details

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